

## YOUR APPLICATION IS OUR FOCUS!

KINEMATICA is a leading manufacturer of dispersing and mixing technology for standard and customized applications in the lab, pilot plant and production areas of pharmaceutical, chemical, food, cosmetic and biotech or life science companies worldwide.

Our POLYTRON® batch and MEGATRON® In-line Homogenizers are suitable for many applications:

- Dispersing of non-soluble liquids or solids into liquids to finest emulsions/multiple emulsions or suspensions
- Induction and dispersion of powders into liquids
- Foaming by gas induction into liquids
- Disintegration of tissue samples for preparation in further analysis
- Dispersing of various samples for quality control

We also deliver POLYMIX® Micro Dry Grinding Mills and a variety of POLYMIX® and MICROTRON® Overhead Stirrers and Mixers.

Whatever your application, we are confident that our team of specialists, with over 60 years of experience, will provide the best solution for you.

## YOUR SATISFACTION IS OUR GOAL!



**KINEMATICA**  
DISPERSING AND MIXING TECHNOLOGY

### BRAND NAMES WITH HISTORY



Batch dispersing/homogenizing units



High turbulent mixing



Inline dispersing/homogenizing units



Dispersing/homogenizing Reactors



Stirrers and dry Mills



Mixer/Blender



Viscometers



PT\_10-35GT\_eng\_03/2013, Technical changes and mistakes reserve



## POLYTRON® PT 10-35 GT



### Powerful stand-disperser (Ecoline)

#### FLEXIBLE-USE DISPERSER

For a variety of applications

«Working volume 0.1 to 10,000 ml»

Headquarters  
**KINEMATICA AG**  
Dispersing and Mixing Technology

Luzernerstrasse 147a  
6014 Luzern  
Switzerland

Tel. +41 41 259 65 65  
Fax +41 41 259 65 75  
E-Mail info@kinematica.ch

Subsidiaries  
**KINEMATICA, INC.**  
Dispersing and Mixing Technology

155 Keyland Court  
Bohemia, NY 11716  
USA

Tel. +1 631 750 66 53  
Fax +1 631 750 66 57  
E-Mail info@kinematica-inc.com

**KINEMATICA AG**  
Dispersing and Mixing Technology

Office Eastern Europe  
Prosp. Akad. Palladina 44  
UA – Kyiv 03680

Tel./ Fax +38 044 422 61 27  
E-Mail info@kinematica.com.ua  
web www.kinematica.com.ua

**KINEMATICA GMBH**  
Dispersing and Mixing Technology

Münstertäler Str. 12  
79427 Eschbach  
Germany

E-Mail info@kinematica.de  
web www.kinematica.de



**KINEMATICA**  
DISPERSING AND MIXING TECHNOLOGY

# POLYTRON® - Efficient and powerful

# Users / Application ranges

PT 10-35 GT features high drive power and a sleek design. With its large reserve capacity, it can be used to sample recipes with larger volumes as easily as preparing samples with much smaller amounts.

## TECHNICAL INFORMATION

**Processing volume (water)**  
0.1 up to 10,000 ml

**Tip speed**  
Up to max. 34 m/s

**Applicable aggregates**  
ø 5 mm to ø 36 mm

**Speed range**  
500 to 30,000 rpm

**Drive coupling**  
Aggregates with F coupling

**Noise level (drive without aggregate)**  
75 dB(A) at 25,000 rpm  
82 dB(A) at 30,000 rpm

**Motor**  
Universal with carbon brushes

**Drive power**  
1200W

**Connection voltage**  
90 - 230 V ± 10%, 50Hz / 60Hz

**Relative humidity (max.)**  
80% during storage  
80% during operation

**Operating temperature**  
0 - 40 °C

**Protection class acc. to DIN**  
IP 20

**Dimensions (L x W x H)**  
Drive: 95 x 210 x 247 mm

**Weight**  
Drive: 3200 g

**EMC standards**  
IEC/EN 61000-6-2 / EN 61000-6-3

**Safety standard**  
IEC/EN 61010-2-51

## THE EXPERT FOR YOUR LABORATORY

For more than 60 years, we have been perfecting the rotor/stator technology, working in close cooperation with users and universities. When using our technology, your test samples will be dispersed into homogeneous, chemical systems. Depending on the type of sample, they link with liquids, forming the smallest homogeneous emulsions, dispersions or suspensions. This is the best foundation for all subsequent analyses or the implementation of formulation your laboratory can provide to your R&D centre or production facility.

## ERGONOMICS:

- Easy operation with an on-off switch and speed control
- Intelligent variable speed control for long equipment life
- Speed stability even with changes in viscosity
- Easy adjustment of motor height
- Switch aggregate quickly with Click & Go coupling
- Easy aggregate clean-up with EasyClean Design



## RESULTS ARE CONVINCING

**SMALLEST SIZES OF PARTICLES/DROPLETS**  
because precise analysis require homogeneous samples

**EFFICIENT SAMPLE PREPARATION**  
because fast dispersion saves time

**STANDARD OR CUSTOM-MADE AGGREGATES**  
Perfected for a in cooperation with the users

**CLEANING AND DISASSEMBLY**  
EasyClean Design makes it very simple

**QUICK ENGAGEMENT OF THE AGGREGATES** by using Click & Go

**BEST MATERIALS AVAILABLE**  
because without them, we could not call it Swiss Made

**DURABILITY** is a Swiss virtue



General homogenizer applications

Dispersions, suspensions, and emulsions

Comminution of animal and human tissue samples in various liquids and volumes

Dissolving solids even at higher viscosities

Formulation of food products

Formulation of lotions, creams and foodstuffs

Extraction of active pharmaceutical ingredients (API) in pills and tablets

Preparation of samples for quality assurance/control

*This list provides a small selection of possible applications.*



# Kinematic dispersion using the rotor/stator system

## Who is the founder of it?

The roots of today's KINEMATICA began in the former chemical/physical research institute of Prof. P. Willems in Lucerne, Switzerland. The inventor of the modern rotor/stator dispersion technology.

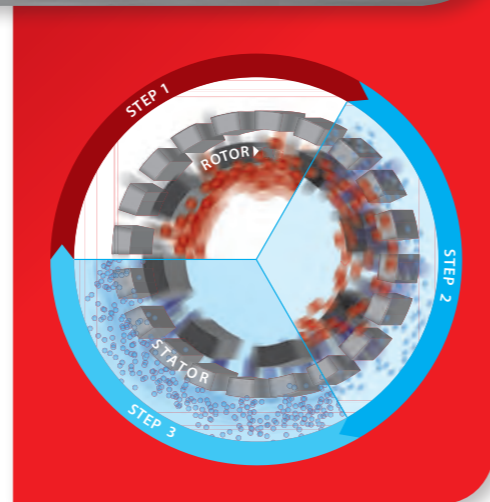
### THE PRINCIPLE:

The spinning rotor generates a vacuum. The dispersing sample is drawn in and discharged to the outside through the stator's slots. Between the rotor/stator (shear gap), the product is subject to high deceleration-tangential and radial acceleration forces. The individual particles/droplets are torn apart and thus reduced in size; they are reduced several micrometers in size through additional cutting and crashing effects.

### THE RESULT:

Microscopic homogenized dispersions, emulsions, suspensions, and foams are generated. Droplets, particles, and gas bubbles are reduced to several micrometers or smaller. Small and large substances are dispersed more economically, faster, and better than make with any other system.

Your samples are efficiently «POLYTRONIZED».



# Aggregate Technology

## Unrivaled!

The high efficiency and the uniqueness of our POLYTRON® dispersing aggregate can only be achieved through superior manufacturing precision and the sophisticated KINEMATICA design method. This is 100% Swiss Made.

### STANDARD AGGREGATES (EC DESIGN, WITH TWO OR MORE SPROCKETS)

This is all you need for popular applications in the preparation of samples and formulation development. The cutting teeth embedded in the head of the tool optimize the pre-crushing of the sample. An enclosed ring design provides optimum protection for those teeth and prevents them from bending.

### SPECIAL AGGREGATES (W, M, B, DS, Z DESIGN)

Specializations in the chemical, pharmaceutical, cosmetic, and food industry, as well as the life science branch, makes new designs inevitable. These aggregates are based on state-of-the-art technology and only available from KINEMATICA.

The highly specialized tool is subject to constant further development that involves close cooperation with our customers and universities. Thus, it is continuously perfected for daily application.

### MATERIALS

Whether you need a tool with standard or special geometry, all aggregates are manufactured from high-alloy stainless steel 316L, electrolytically polished and made in Switzerland.

### BEARINGS

Depending on the diameter, our aggregates are made with high-quality plastic, special carbide or bronze/carbide bearings. They have excellent mechanical properties and chemical resistance and have FDA approvals. Super high-speed ball bearings are used in the couplings to provide stability at speeds of up to 30,000 rpm.

### CLEANING AND DISASSEMBLY

EasyClean: Our technology ensures the simplest removal and fast cleaning, either by hand, dishwasher, or autoclave. Disassembling the precisely fitting components is simple and fast.

### LOCKING SYSTEM

All our POLYTRON® aggregates are fitted with a high-precision quick-release system: The Click & Go

# Dispersing aggregates for PT 10-35 GT

## Your applications, our response

KINEMATICA aggregates solve all problems you are faced with during every day at the laboratory. Using our Click & Go quick release makes the changing of aggregates very easy.



### EC «STANDARD DISPERSING AGGREGATE»



**Design**  
The universal geometry uses two rows of teeth, is suitable for a large spectrum of laboratory applications, and it is reliable and efficient.

**Selection and applications**

- All standard dispersing tasks
- Grinding of animal and human tissue samples in a variety of fluids and volumes
- Sample preparation for the extraction and dissolution of organic materials
- Sample preparation for medical diagnostic procedures as well as DNA analysis
- Extractions of systems/substances from vegetable-derived samples
- Disruption of animal and human cells
- Deagglomeration of united cell structures
- Intensive mixing

Sales No.:	Description	ø/length mm	Volume ml	max. Tip speed m/s
11030297	PT-DA 05/2EC-F078	5 / 78	0.1 - 5	5
11030298	PT-DA 07/2EC-F101	7 / 101	0.3 - 10	8
11030299	PT-DA 12/2EC-F154	12 / 154	3 - 250	14
11030302	PT-DA 20/2EC-F193	20 / 193	20 - 2'000	22
11030305	PT-DA 30/2EC-F250	30 / 250	100 - 4'000	30
11030311	PT-DA 30/4EC-F250	30 / 250	100 - 4'000	30
11030313	PT-DA 36/2EC-F250	36 / 250	200 - 4'500	34
11030317	PT-DA 36/4EC-F250	36 / 250	200 - 4'500	34

### G «GAS TIGHT»

**Design**  
Integrated mechanical seals

**Selection and applications**

- Under pressure or vacuum
- Preventing air from being added to emulsions
- Aggressive acid mixtures



Sales No.:	Description	ø/length mm	Volume ml	max. Tip speed m/s
11030295	PT-DA 20/2G-F210	12 / 157	20 - 2'000	22
11030306	PT-DA 30/2G-F273	30 / 273	100 - 4'000	30
11030312	PT-DA 30/4G-F273	30 / 273	100 - 4'000	30
11030316	PT-DA 36/2G-F273	36 / 273	200 - 4'500	34
11030318	PT-DA 36/4G-F273	36 / 273	200 - 4'500	34

### Z «Z-DESIGN»

**Design**  
Breaking up of hard probes, with integrated V-notch technology. Additional, integrated holes for cleaning

**Selection and applications**

- Hard and brittle material
- Sweet corn and grain
- Breaking, open and dispersing of pills
- Breaking, hard grains



Sales No.:	Description	ø/length mm	Volume ml	max. Tip speed m/s
11030310	PT-DA 30/2ZEC-F250	30 / 250	100 - 4'000	29

### B «BIOTRONA® HIGH-TURBULENCE MIXER»

**Design**  
High-turbulence mixing head with the least possible shear forces and energy inputs

**Selection and applications**

- Quick removal and suspension of solid particles; also suitable for high viscosity applications



Sales No.:	Description	ø/length mm	Volume ml	max. Tip speed m/s
11030296	PT-DA 20/BEC-F193	20 / 193	100 - 2'000	21
11030314	PT-DA 36/BEC-F250	36 / 250	500 - 10'000	34

### DS «DISSOLVER»

**Design**  
A processing head with teeth. The product is radially accelerated

**Selection and applications**

- Fast mixing and homogenizing of solids in liquid
- Processing of highly viscous products



Sales No.:	Description	ø/length mm	Volume ml	max. Tip speed m/s
11030344	PT-DA 30/DS-F250	30 / 107	500 - 10'000	30

### TIN «TITANIUM NITRATED» - UPGRADE

**Design**  
Rotor and/or stator with up to three rows of teeth with a titanium nitrated (TIN) coating

**Selection and applications**

- All dispersing applications with abrasive components



Sales No.:	Description
11035050	TiN rotor for the selected dispersing aggregate, ø 12-36 mm
11035150	TiN stator for the selected dispersing aggregate, ø 12-36 mm

### M «OUTSIDE CUTTING BLADES»



**Design**  
Outside blades pre-crush samples that are larger than the rotors diameter. Subsequently, they are just dispersed inside the generator

**Selection and applications**

- Dispersing of large samples made simple
- All standard dispersing applications similar to EC aggregate

Sales No.:	Description	ø/length mm	Volume ml	max. Tip speed m/s
11030300	PT-DA 12/2MEC-F154	12 / 154	3 - 250	14
11030303	PT-DA 20/2MEC-F193	20 / 193	20 - 2'000	22
11030307	PT-DA 30/2MEC-F250	30 / 250	100 - 4'000	30
11030308	PT-DA 30/2MG-F273*	30 / 273	100 - 4'000	30
11030315	PT-DA 36/2MEC-F250	36 / 250	200 - 4'500	34

\* M-design aggregate in gas-tight model

### W «W-DESIGN»



**Design**  
The W design prevents fibrous, stringy or solid samples from clogging the aggregate

**Selection and applications**

- Dispersing fibrous, stringy or solid samples (e.g., pieces of meat)
- All standard dispersing applications similar to EC aggregate

Sales No.:	Description	ø/length mm	Volume ml	max. Tip speed m/s
11030301	PT-DA 12/2WEC-F154	12 / 154	3 - 250	14
11030304	PT-DA 20/2WEC-F193	20 / 193	20 - 2'000	22
11030294	PT-DA 20/2G-F210*	20 / 210	20 - 2'000	30
11030309	PT-DA 30/2WEC-F250	30 / 250	100 - 4'000	30
	PT-DA 30/2WMEC-F250**	30 / 250	100 - 4'000	30
11030319	PT-DA 36/2WEC-F250	36 / 250	200 - 4'500	34
	PT-DA 36/2WMEC-F250**	36 / 250	100 - 4'500	34

\* W-design aggregate in gas-tight model

\*\* W-Design aggregate with knives

# Dispersing vessels

Choosing the right dispersing aggregate is crucial for good results. The right vessel also helps contribute to achieving the desired results.

## THE PROBLEM

For normal cylindrical dispersing jars, the flow creates a vortex. The mixing and dispersing efficiency decreases considerably since the product is no longer being optimally processed through the dispersing generator head. This lengthens processing times and thus requiring more energy input. Depending on the shape of the vortex, this may also lead to additional air being introduced.

## THE SOLUTION

Our specially designed GS jars have a cloverleaf-like shape. This effectively interrupts the flow in the radial direction and generates additional counteracting forces. These high turbulences maximize the mixing and dispersion efficiency, thus minimizing processing time and requiring less energy.

## THE SELECTION

Our GS-glasses are available in chemical- and temperature-resistant borosilicate glass or in stainless steel. Dimensions from a few milliliters to several liters are available, with or without lid, with or without sealed feedthrough.



GS vessel principle  
(viewed from above)



## THE RIGHT DISPERSING VESSEL



Designation	Sales no.:	Ø / H (mm)	Process volume	Model	
GS 15	11050010	30 / 150	35 ml	Cloverleaf shaped Borosilicate glass	top open without cover
GS 25	11050011	55 / 150	150 ml		
GS 40	11050012	80 / 200	500 ml		
GS 50	11050013	90 / 250	1000 ml		
GS 60	11050014	100 / 300	1300 ml		
GS 15 K	11050020	30 / 150	35 ml		
GS 25 K	11050021	55 / 150	150 ml		
GS 40 K	11050022	80 / 200	500 ml		
GS 50 K	11050023	90 / 250	1000 ml		
GS 60 K	11050024	100 / 300	1300 ml		
GS 15 KL 7.5	11050030	30 / 150	35 ml	Cylindrical Stainless steel	open top with cover
GS 25 KL 12	11050031	55 / 150	150 ml		
GS 25 KL 20	11050032	55 / 150	150 ml		
GS 40 KL 25	11050034	80 / 200	500 ml		
GS 50 KL 25	11050036	90 / 250	1000 ml		
GS 60 KL 25	11050038	100 / 300	1300 ml		
GS 100 Z	11050060	100 / 150	900 ml	Cylindrical Stainless steel	open top without lid
GS 130 Z	11050061	125 / 170	2000 ml		
GS 155 Z	11050062	175 / 190	3500 ml		

# Order information and accessories

Depending on your specific requirements, it is possible to expand the PT 10-35 GT drive with our functional accessories. Our expert personnel will be happy to assist you and answer all the questions you might have.

## ADAPTER

Adapters for use with dispersing aggregate with A coupling

Bestell-Nr.	Designation
11035001	Adapter PT-DA / PTA (F/A)

## Description

This adapter connects older A-coupling dispersing aggregates such as PT-K / PT-G with this PT 10-35 GT motor (with F-coupling).



## DRIVES / COMPLETE SYSTEMS

Sales No.:	Description
<b>Motor</b>	
11010104	POLYTRON® PT 10-35 GT, 230 V / EU-Power cord, extension rod, if stands ST-P 20/600 and ST-F 20/600 are preferred
11010105	POLYTRON® PT 10-35 GT, 230 V / CH-Power cord, extension rod, if stands ST-P 20/600 and ST-F 20/600 are preferred
11010106	POLYTRON® PT 10-35 GT, 230 V / UK-Power cord, extension rod, if stands ST-P 20/600 and ST-F 20/600 are preferred
11010103	POLYTRON® PT 10-35 GT, 100-120 V / Power cord, extension rod, if stands ST-P 20/600 and ST-F 20/600 are preferred
<b>Motor is sold with stand and accessories</b>	
11090070	PT 10-35 GT, 230 V, EU-Power cord, stand ST-P11/600 with vessel holder and safety ring
11090071	PT 10-35 GT, 230 V, CH-Power cord, stand ST-P11/600 with vessel holder and safety ring
11090073	PT 10-35 GT, 230 V, UK-Power cord, stand ST-P11/600 with vessel holder and safety ring
11090072	PT 10-35 GT, 100-120 V, Power cord, stand ST-P11/600 with vessel holder and safety ring



## STANDS

Figure	1	2	3	4	4	4	4	
Sales no.:	11040050	11040051	11040020	11040033	11040036	11040037	11040034	
Designation	ST-P10/600	ST-P20/600	ST-F20/600	ST-P 14/590+500, 230 V (EU-plug)	ST-P 14/590+500, 230 V (CH-plug)	ST-P 14/590+500, 230 V (UK-plug)	ST-P 14/590+500, 100-120 V	
Description	Plate stand for safe and easy height adjustment of the motor. The head clamp with a knurled nut is secured to motor and prevents rotation around the extension.	Plate stand with two support rods. The motor's height can be adjusted. For more security, the motor cannot be adjusted horizontally.	H-foot stand with two columns. Maximum stability. The motor's height can be adjusted. For more security, the motor cannot be adjusted horizontally.	Electric plate stand with lifting telescopic bar for more ease of use. Incl. up/down button and mat to prevent slipping.	The electronics are designed for ambient temperatures of +5°C to +40°C and were tested per EN 60335-1 and UL 962.			



## STAND ACCESSORIES

Sales no.:	Designation	Description
11045013	Vessel holder for ST-P 10/600	Vessel holder for fixing any mixing vessels
11045035	Safety ring for stand ST-P 10/600	The safety ring prevents uncontrolled lowering of the motor. Can also be used to fixing the motor height
11045011	Vessel holder with boss head clamp for ST-P 20/600 & ST-F 20/600	
11045031	Safety ring for stand ST-P 20/600 & ST-F 20/600	
11036005	Vessel holder with guide for ST-P 14/590+500	
11036002	Extension rod	Short extension rod for PT 10-35 GT. Required for use with the ST-P 14/590+500 telescopic stand